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OBJECTS: The furtherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous flora and fauna.

MEETINGS: Second Tuesday of each month at 8pm at the Cairns Education Centre, Greenslopes Street, Edgehill, Cairns.

FIELD DAYS: Sunday before meeting.

MUSEUM OF VICTORIA



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SUBSCRIPTIONS: (Due September 30th)

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NOTES FROM THE EDITOR

During the course of gathering articles for the Journal and in keeping with the aims and traditions of the North Queensland Naturalists, not only are the articles interesting, educational and entertaining so are the authors themselves who I have had the pleasure to meet. One of whom is the Senior Curator (Vertebrates) of the Queensland Museum - Jeanette Covacevich. Jeanette has asked me to advise members of the 1995 symposium being held in the Queensland Museum Lecture Theatre on 14th October. It will be on 'The History of Natural History in Queensland' and is well worth attending.

'In 1845 (29th March), survivors of the Leichhardt expedition of discovery of new places, plants, fossils, animals and peoples returned to Sydney. The 1995 symposium will commemorate the great achievements of this extraordinary expedition from Jimbour on the Darling Downs, Queensland to Port Essington, in the Northern Territory and will also celebrate discovery and documentation of natural history in Queensland.'

Those interested in being either a speaker or spectator may phone direct (07 8407708).

Inside knowledge obtained is that Ken Simpson's new beaut 'Field Guide to Australian Birds' will be available by Christmas as well as Paul Merriott's 'Banksias of Australia'.

Our next Journal is No. 200. To make this a special commemorative issue we'd like to see more articles coming in from current members. If there's something you'd like to write about but have difficulty in putting it to paper - let us know so we may be able to assist you. Some local issues of environmental concern and comments would be interesting to record as well as some personal views and solutions. So get those thinking caps on!

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POSITIVE PLANT-FUNGUS RELATIONSHIPS AND THE MYCORRHIZAL ASSOCIATION.

By: V.A. GORDON

The progression of life on land is linked to the availability of limited quantities of photosynthetically fixed carbon. Competition for this resource necessitates more or less intimate relationships between carbon autotrophic (produces own carbon), and heterotrophic (requires external carbon source) organisms, and has been the central selective force in the coevolutionary development of life (Pirozynski, 1980). Of the heterotrophs that associate with plants directly, few have longer history or have formed more intimate relationships than fungi.

Without fungi, life on earth as we know it would be almost destroyed within 50 - 60 years (Dikenson and Lucas, 1979). Fungi are the main recycling agents for most of the dead plant material produced on earth. Without them, logs and plant litter would not become humus and return to the soil. Without this composting action of the fungi, the rising heaps of dead plant material would steadily lock away all the earths nutrients.

However, foremost among the positive plant-fungus associations is the mycorrhizal association. This is a symbiotic association between the roots of most plants and certain fungi, in which the fungi essentially function as absorbing organs for the plants.

The mycorrhizal fungi increase the solubility of minerals in the soil, improve the uptake of nutrients for the host plant, protect the hosts roots against pathogens, produce plant growth hormones and move carbohydrates from one plant to another (plants with a well formed mycorrhizal association exhibit a much greater ability to successfully establish and compete compared to those without a mycorrhizal association). In return, the host plant provides the fungi with carbohydrates and amino acids (Alexopoulos and Mims, 1979).

There are five different types of mycorrhizae, the two main types being vesicular-arbuscular mycorrhizae (VAM) and ectomycorrhizae (EM). VAM have the widest host range and distribution of all the mycorrhizal associations. It is estimated that about 90% of vascular plants normally establish VAM. VAM have been observed in 1000 genera of plants representing some 200 families (Bagyaraj, 1991). There are at least 300,000 receptive hosts in the world flora (Kendrick and Birch, 1985). Most of the tropical rainforest trees are VAM (Janos, 1983). 120 species of VAM fungi have been described, and they are all grouped in a single family, the Endogonaceae (Schenck and Perez, 1987) within the fungal class Zygomycetes. In addition to their widespread distribution throughout the plant kingdom, VAM fungi are also geographically ubiquitous and occur in plants growing in the arctic, temperate and tropical regions (Mosse et al, 1981).

Meyer (1973) has reported EM associations with 3% of the phanerogams. They are more prevalent in the members of Pinaceae, Fagaceae, Betulaceae and Salicaceae. However, few genera from other families such as Eucalyptus, Tilia and Arbutus, are also members of Caesalpinaceae and Dipterocarpaceae, form EM associations. Most of the wet and dry sclerophyll forest trees are EM. The EM fungi mostly belong to the fungal classes Ascomycetes and Basidiomycetes. However, a few of the Endogonaceae and sterile imperfect fungi are also involved (Bakshi, 1974; Warcup, 1975).

These two associations are distinguished on the basis of the relationship of the fungus hyphae to the cells of the plant root. VAM are characterised by growth of the hyphae in an intercellular fashion, penetrating root hairs and other epidermal cells as well as cortical cells usually with no dense hyphal growth on the root surface. The hyphae form swellings (vesicles) and minute branches (arbuscles) within the root cells. This is the point in the VAM association where nutrients are exchanged, the fungal hyphae extending out into the soil. EM are characterised by hyphae that grow in an intercellular fashion. Typically an infected root is covered by an hyphal mantle from which extends hyphae, usually into the first layers of the root cortex, where nutrients are exchanged in the EM association. As with the VAM, the fungal hyphae extends out into the soil.

Because of the widespread occurrence in nature of their numerous benefits to plants, researchers in several disciplines have become interested in studying mycorrhizae. Applications for these fungi are being found not only in rehabilitation of disturbed ecosystems, but also agriculture, horticulture and forestry.

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GEORGETOWN - EASTER - THE NORTH QUEENSLAND NATURALIST CLUB

COMPARATIVE COVERAGE OF EASTER '94 AND EASTER '95.

BY: Dawn Magarry

EASTER 1994 - NOT JUST BIRDWATCHING!

The North Queensland Naturalist Club has been visiting the Georgetown area at Easter for almost 20 years - nearly always to observe the bird life so abundant after the summer rains.

This year proved no exception and 114 species were recorded for the weekend. Many species had bred due to good grass seed cover and an abundance of insects - mainly grasshoppers. Those sighted on eggs, feeding young at the nest or dependent juveniles were:-

Red Tailed Black Cockatoo
Black Throated Finch
Mistletoe Bird
White Winged Triller
Sacred Kingfisher
Apostle Bird
Australasian Grebe

Rufous Throated Honeyeater
Yellow Tinted Honeyeater
Blue Faced Honeyeater
Diamond Dove
Tawny Frogmouth
Black Winged Stilt
Pacific Black Duck

Another interesting sighting was that of an Intermediate Egret with blue wing tags and a metal band on its leg. Enquiries on our return revealed it as having been tagged at the Macquarie Marshes in New South Wales by the Australian Bird Study Association during the summer of 1993/94. It had travelled approximately 1468km north.

Due to earlier rains there were numerous plants and trees

still in flower. A species of Terminalia with strongly perfumed flowers of cream/yellow attracted many butterflies of both the Big Greasy and Common Crow. The blossom however, seemed to hold no appeal for the birds.

Terminalia platyptera had flowered and the interesting winged seeds were just starting to form. Black Faced Woodswallows were feeding on a heavy crop of seeds on the Maytensis disperma. Cassia magnifolia was in flower along the Forsayth Road which attracted the Sulpha Crested Cockatoos.

Water plants identified were blue Bog hyacinth Monochoria cyanea, yellow Nymphoides hydrochariodes, and in the damp areas where water had receded blue Commelina cyanea, Willow primrose Ludwigia octovalvus with its soft foliage and four petalled yellow flowers were observed. Small ground plants included blue Evolvulus alsinoides, Goodenia sp., Spade flower Hybanthus enneaspermus and both the yellow and bright pink species of Calandrina.

The creeper Cayratia trifolia was also identified. This is a soft leafed vine which can be seen on rocks and trees. The hop bushes Dodoneas in the area had a good crop of yellowing, papery seed pods. Stands of prickly Acacia farnesiana fast becoming a pest in grazing country are ideal places for finches to nest. Another thorny favourite nesting tree of the smaller birds is the Chinee Apple, Zizyphus mauritiana. This tree seen throughout the area was introduced to Australia by Chinese immigrants. It has a rather overpowering smell when in bloom and the small apple-like fruit is popular with Red Tailed Black Cockatoos. In addition to the introduced plants to the area we listed Calotropis gigantia with its large pale grey/green leaves and unusual flowers not unlike small crowns.

Eucalyptus polycarpa was just beginning to flower attracting the Rainbow Lorikeets. Other trees in the area include Brachychiton vitifolius, Erythrina (Batswing Coral tree), small leafed Bauhinia cunninghamii, another favourite of the woodswallows when flowering. Eucalyptus brownii, E. camaldensis, E. confertifolia, E. similis are recorded for the area as well as the screw palm Pandanus spiralis and several species of Melaleuca namely M. argenticia and M. viridiflora.

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| North Australian Plants | - | Jenny Harmer |
| Exotica | - | Alfred Byrd Graf |
| Field Guide to Birds of Australia | - | Simpson & Day |

GEORGETOWN - EASTER 1995

The Georgetown area experienced good rain again this year so grass and weeds were abundant - especially spear grass and 'cobblers pegs' - the bane of birdwatchers' socks.

NOTES ON THE VEGETATION OF 'SECTION F'
CAIRNS CENTRAL SWAMP.

By: R. Jago

(A CONTINUATION OF THE LISTING OF ALL PLANTS OF THE CAIRNS CENTRAL SWAMP. OUR PREVIOUS JOURNAL DEPICTS THE LOCALITY MAPS FOR YOUR REFERENCE).

This section contains at least 204 species of vascular plants, some 158 species being native to this area with 45 exotic species now naturalized in this section.

One native species *Peltophorum pterocarpum* has also become naturalized in this section.

The dune, swale system is quite well preserved in this area.

PRELIMINARY CHECK LIST OF VASCULAR PLANT SPECIES SECTION 'F'
OF THE CAIRNS CENTRAL SWAMP. By: R. Jago.

PTERIDOPHYTES Ferns

| | | |
|------------------------------------------------|---------------------|---|
| <i>Blechnum idicum</i> | Swamp water fern | C |
| <i>Drynaria rigidula</i> | Basket fern | U |
| <i>Helminthostachys zeylanica</i> | Flowering fern | U |
| <i>Lindsaea ensifolia</i> s. sp. <i>agatii</i> | | C |
| <i>Lygodium flexuosum</i> | Snake fern | C |
| <i>Lygodium microphyllum</i> | | C |
| <i>Platycerium hillii</i> | Northern elkhorn | U |
| <i>Pyrrosia longifolia</i> | | U |
| <i>Stenochlaena palustris</i> | Climbing swamp fern | C |

GYMNOSPERMS

| | | |
|--------------------------|------------|---|
| <i>Podocarpus grayae</i> | Brown pine | U |
|--------------------------|------------|---|

ANGIOSPERMS Dicotyledons

| | | |
|----------------------------------------------------------|---------------------|---|
| <i>Abrus precatorius</i> | Gidee gidee | U |
| <i>Acacia crassicarpa</i> | Brown wattle | C |
| <i>Acacia mangium</i> | Sally wattle | C |
| <i>Acanthus ilicifolius</i> | Holly leaf mangrove | C |
| <i>Acmena hemilampra</i> s. sp. <i>hemilampra</i> | Cassowary gum | C |
| <i>Aegiceras corniculatum</i> | River mangrove | U |
| <i>Aegiceras moluccana</i> subsp. <i>rockinghamensis</i> | Candle nut | C |
| <i>Alphitonia excelsa</i> | Red ash | C |
| <i>Alstonia muellerana</i> | Hard milkwood | C |
| <i>Alstonia scholaris</i> | Milky pine | C |
| <i>Arytera divaricata</i> | Rose tamarind | U |
| <i>Avicennia eucalyptifolia</i> | Grey mangrove | U |
| <i>Beilschmiedia obtusifolia</i> | Blush walnut | C |
| <i>Breynia stipitata</i> | Stinking leaf tree | C |
| <i>Brucea javanica</i> | | C |
| <i>Canarium australianum</i> s. sp. <i>glabrum</i> | Mango bark | C |

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| | | |
|---------------------------------------|-----------------------|---|
| Canarium vitiense | Canaruim | U |
| Canthium coprosmoides | | C |
| Carallia brachiata | Corky bark | C |
| Cayratia maritima | Native grape | C |
| Chionanthus ramiflorus | Native olive | C |
| Cissus repens | Native grape | U |
| Claoxylon tenerifolium | | C |
| Cleistanthus apodus | | C |
| Clerodendrum longiflorum var. glabrum | | C |
| Commersonia bartramia | Brown kurrajong | C |
| Cryptocarya hypospodia | Northern laurel | C |
| Cryptocarya triplinervis var. riparia | | |
| Decaspermum humile | Brown laurel | C |
| Deplanchea tetraphylla | Brown myrtle | C |
| Diploglottis diphylllostegia | Wallaby wireless tree | C |
| Dillenia alata | Native tamerind | U |
| Dischidia nummularia | Red beech | C |
| Dyxosylum latifolium | Button orchid | C |
| Endiandra hypotephra | | U |
| Eucalyptus tessellaris | Rose walnut | C |
| Eupomatia laurina | Moreton Bay ash | C |
| Faradaya splendida | Wujigay | U |
| Ficus benjamina | | U |
| Ficus congesta | Weeping fig | C |
| Ficus opposita | Red leaf fig | C |
| Ficus racemosa | Sandpaper fig | C |
| Ficus virens | Cluster fig | C |
| Ganophyllum falcata | Fig | C |
| Glochidion philippicum | Scaly ash | C |
| Glochidion sumatranum | Buttonwood | C |
| Gmelina dalrympleana | Buttonwood | C |
| Gmelina fasciciliflora | Grey beech | C |
| Gomphandra australiana | White beech | U |
| Guioa acutifolia | Buff beech | C |
| Gymnanthera oblonga | | C |
| Hedyotis auricularia var melanesica | | U |
| Hibiscus tiliaceus | | U |
| Hoya australis s. sp. tenuipes | Cottonwood | C |
| Hypserpa laurina | Hoya | U |
| Ichnocarpus frutescens | | U |
| Jagera pseudorhus | | C |
| Jasminum aemulum | Foam bark | C |
| Jasminum didymum | | C |
| Limnophylla aromatica | | C |
| Litsea fawcettiana | | U |
| Lophostemon suaveolens | Bollywood | C |
| Ludwigia octovalvis | Swamp mahogany | C |
| Lumnitzera racemosa | Willow primrose | C |
| Macaranga involucrata | Black mangrove | U |
| var. mallotoides | | |
| Macaranga tanarius | | C |
| Maesa muelleri | Blush macaranga | C |
| Malaisia scandens | | U |
| Mallotus philippensis | Crows ash vine | U |
| Melaleuca dealbata | Kamala | C |
| Melaleuca leucadendra | Tea tree | C |
| | Tea tree | C |

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| | | |
|-----------------------------------|-------------------|---|
| Melaleuca quinquenervia | Tea tree | C |
| Melaleuca viridiflora | Tea tree | C |
| Melia azedarach var. australasica | White cedar | C |
| Melodinus acutiflorus | | U |
| Melodorum leichhardtii | | U |
| Mischocarpus exangulatus | | U |
| Mischocarpus lanchnocarpus | | C |
| Myrmecodia beccarii | Ant plant | U |
| Nauclea orientalis | Leichhardt tree | C |
| Nymphaea ? immutabilis | Water lily | C |
| Omalanthus novo-guineensis | Bleeding heart | C |
| Persicaria subsessilis | Smart weed | C |
| Piper caninum | Native pepper | C |
| Planchonella chartaceae | Dugulla | C |
| Planchonella xerocarpa | Blush coondoo | C |
| Polyalthia nitidissima | Canary beech | C |
| Polyscias australiana | Ivory basswood | C |
| Polyscias elegans | Cellerywood | C |
| Pongamia sp. (=RFK/3295) | | C |
| Prema serratifolia | | C |
| Pseuderanthemum variable | Pastel flower | C |
| Rhamnella vitiensis | | C |
| Rhodamnia sessiliflora | Iron malletwood | U |
| Rhodomyrtus macrocarpus | Finger cherry | C |
| Salacia disepala | | U |
| Sarcopetalum harveyanum | | C |
| Schefflera actinophylla | Umbrella tree | C |
| Scolopia braunii | Flint wood | U |
| Semecarpus australiensis | Tar tree | C |
| Sesuvium portulacastrum | Sea purslane | U |
| Sonneratia alba | Pornupan mangrove | U |
| Sterculia quadrifida | Peanut tree | C |
| Syzygium angophoroides | Satinash | C |
| Syzygium cormiflorum | Bumpy satinash | U |
| Syzygium tierneyanum | Creek satinash | C |
| Tabernaemontana orientalis | Ervatamia | C |
| Terminalia muelleri | Little sea almond | C |
| Terminalia sericocarpa | Damson | C |
| Tetrastigma nitens | | C |
| Tetrasyandra laxiflora | Tetra beech | C |
| Tinospora smilacina | | C |
| Trema orientalis | Poison peach | U |
| Trema tomentosa | Natice peach bush | U |
| Vandasina retusa | Native wistaria | C |
| Vitex acuminata | | U |

MONOCOTYLEDONS

| | | |
|-----------------------------|------------------------|---|
| Alpinia caerulea | Native ginger | C |
| Archontophoenix alexandrae | Alexander palm | C |
| Calamus australis | Hairy Mary lawyer vine | C |
| Calamus caryotoides | Fish-tail lawyer vine | C |
| Cordyline manners-suttoniae | Cordyline | C |
| Cyperus haspan | | U |
| Cyperus javanicus | | C |
| Dendrobium discolor | Golden orchid | U |
| Dendrobium teretifolium | Pencil orchid | U |

| | | |
|----------------------------------|------------------------|---|
| Dianella bambusifolia | Flax lily | C |
| Dioscorea bulbifera | Cheeky yam | C |
| Eustrephus latifolius | Wombat berry | C |
| Fimbristylis ferruginea | | C |
| Flagellaria indica | Supple Jack | C |
| Geitonoplesium cymosum | Scrambling lily | C |
| Geodorum densiflorum | Shepherds crook orchid | C |
| Hydriastele wedlandiana | Water palm | U |
| Hypolytrum nemorum | | C |
| Imperata cylindrica | Blady grass | C |
| Pandanus solms-laubachii | Pandanus palm | C |
| Paspalum scrobicalatum | | U |
| Philydrum lanuginosum | Frog mouth | C |
| Phragmites karka | Reed grass | C |
| Proiphys amboinensis | Cardwell lily | C |
| Ptychosperma elegans | Solitaire palm | C |
| Schoenoplectus litoralis | | C |
| Scleria polycarpa | | C |
| Smilax australis | Sarsaparilla vine | C |
| Sporobolus indicus var. capensis | | U |
| Sporobolus virginicus | Salt water cooch | U |

PRELIMINARY CHECK LIST OF INTRODUCED PLANTS - SECTION 'F'
CAIRNS CENTRAL SWAMP

PTERIDOPHYTES Ferns

| | | |
|--------------------|-------------|---|
| Nephrolepis exalta | Boston fern | U |
|--------------------|-------------|---|

ANGIOSPERMS Dicotyledons

| | | |
|----------------------------|-----------------------|---|
| Ageratum conyzoides | Blue top | U |
| Alternanthera dentata | | U |
| Annona reticulata | | U |
| Ardisia solanacea | Ardisia | C |
| Bidens pilosa | Cobblers peg | U |
| Carica papaya | Pawpaw | U |
| Cassia fistula | Golden shower | U |
| Cassia sp. | | U |
| Crotalaria pallida | Streaked rattle pod | U |
| Desmodium tortuosum | Florida beggar weed | U |
| Eclipta prostrata | | U |
| Lantana camara | Lantana | U |
| Leucaena latisiliqua | Leucaena | U |
| Macroptilium atropurpureum | Sirato | U |
| Mimosa pudica | Sensitive plant | U |
| Mitracarpus hirtus | Clover | U |
| Mormordica charantia | Balsam pear | U |
| Passiflora foetida | Stinking passion pear | U |
| Pedilanthus tithymaloides | Zig zag plant | U |
| Psidium guayana | Guava | U |
| Rivina humilia | Coral berry | C |
| Solanum seaforthianum | Potatoe vine | C |
| Solanum torvum | Devils fig | C |
| Spathodea campanulata | Curse of West Africa | C |
| Stachytarpheta sp. | Blue snake weed | C |

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| | | |
|----------------------------|--------------------|---|
| Stephanophysum longifolium | | R |
| Synedrella nordiflora | Cinderella weed | C |
| Tithonia diversifolia | Japanese sunflower | C |
| Urena lobata | Pink burr | C |

MONOCOTYLEDONS

| | | |
|---------------------------------|--------------------|---|
| Brachiaria mutica | Parra grass | C |
| Chloris ? inflata | Purple top chloris | U |
| Cocos nucifera | Coconut | U |
| Cynodon dactylon | Couch grass | U |
| Cyperus aromaticus | | C |
| Dracaena fragrans | Dracaena | U |
| Echinachola crus-galli | Barnyard grass | U |
| Musa acuminata | Banana | U |
| Panicum maxium | Guinea grass | C |
| Protasparagus sp. No. 1 | Asparagus fern | U |
| Protasparagus sp. No.2 | Asparagus fern | U |
| Setaria sphacelata var. sericea | | U |
| Syngonum podophyllum | Arrow head plant | C |
| Zebrina pendula | Wandering jew | C |

A REEF WALK

By: J.A. McLean

There are perhaps few other places one can experience such superabundance of life forms, glean an inexhaustable source of interest and enjoy such a reservoir of sheer beauty as exists on the Great Barrier Reef. We are indeed fortunate in North Queensland to be in such close proximity to one of the great natural wonders of the world, where all but 20 of the 340 species of corals recorded in the entire Great Barrier Reef system, can be found in luxurious splendour (Australian Heritage Commission 1986).

At low tide during ideal conditions when little or no wind is present and a clear sunny sky prevails, one can participate in such splendour and enjoy an enthralling reef walk in just knee deep water or, venture a little further afield with just the aid of a facemask, snorkel and flippers, to explore and appreciate the wonderful complexity of marine life found in this special wonderland, whether it be reef belonging to a continental island, coral cay or detached reef.

Initially when entering the shallowest zonation of a reef complex, usually only scattered coral outcrops will be viewed while relatively rich algal (seaweed) growth on dead coral surfaces predominate. The first algae observed will probably be brown algae Phaeophyta (Cribb & Cribb 1985) which will vary considerably in shape and habit, some to 100cm in length, appearing to be leathery and spiky with small grape like floats attached (Sargassum spp), nearby wavy pale brown fronds (Padina sp), and angular leaf like appendages are found (Hormophysa sp), some also resembling latticed fabric

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(Hydroclathrus sp), other chocolate brown fans (Lobophora sp), while some are similar to small spiny rimmed flowers (Turbinaria sp). Green algae (Chlorophyta) are also seen with creeping stems, some like cypress twigs (Caulerpa sp) others resembling streams of green beads (Caulerpa sp), lime coloured feathers (Caulerpa sp) are also there which sway gently; brilliant bottle green tufts of turtle weed (Chlorodesmis sp) are noticeable, and others are almost kidney shaped (Halimeda sp). Collectively most of the green algae are only a few centimeters long. In deeper water red algae (Rhodophyta) are located; clumps of crisp and brittle stems are present (Acanthophora sp); small flattened rods of regular forked algae; tough rubbery ribbons; cylindrical forms tapering to fine points; irregular outlines varying from light pink to deep claret are all to be found.

In only knee deep water often the ever wary honey brown, blue spotted fantail ray (Taeniura lymna Grant 1975) will be observed scurrying off, while only a few steps further on a sleepy small browmepaulette shark (Hemiscyllium ocellatum) lies half concealed under flat limestone. Over sandy and rocky areas spider shells (Lambis sp) are seen, they are herbivores which feed on algae or detrital material, the undersides of the shells are purple and orange. Another algae feeder appears, a school of golden spinefoot fish (Siganus sp) darting away to deeper water, then one catches sight of just one of many oddities the reef embraces, the amazing beche de mer (Holothuria) which may range in colour from mottled cream to various shades of yellow, orange, brown and black. Some of these sluggish sausage shaped creatures are truly remarkable, being able to eviscerate the whole of their internal organs if attacked by a predator, but then able to regenerate them again (except for the reproductive organs) in only a few days (Roughley 1943). You move on and overturn a large piece of limestone, the display of colours attached to the hidden side delight the imagination, sea squirts (Ascidacea) of apricot, red, and pink are hanging delicately, several orange-ringed money cowie shells (Cypraea annulus Wilson and Gillett 1982) adhere like glistening buttons, a brittle starfish (Ophiocoma sp) ripples, dozens of painted hard coralline algae greet the eye, eventually you replace the limestone as you found it. (This is important - otherwise prolong sunlight will damage the delicate marine life). Then you see small clams (Tridacna sp) with blue green and yellow brown mantles which are so dependant on the tiny mutual unicellular algae (Zooxanthellae) for their growth. Nearby, over sand, a small pale cone shell (Conus arenatus) is finely peppered with brown dots and as you move into slightly deeper water, a tiny but brilliant coloured clown fish (Amphiprion percula) as lovely as any bird of paradise partly hides in a flower like anemone (Physobranchia), to the left a glossy spotted tiger cowie shell (Cypraea sp) rests with its mantle exposed, while to the right just like a jewel, a blue starfish (Linckia laevigata) rests. As the water deepens coral and fish like become richer, forests of branching staghorn coral (Acropora spp) in infinite varieties of intermediate shades catch the eye, there are also magnificent radiating plates of blue and yellow coral. Round

and angular shelves of coral are present, rich greens and browns of honeycomb coral (Favites), fingers of brooding purples, delicate pinks, soft blues, elsewhere others resemble balls of cotton or an incrustation of broccoli, all the result of millions of tiny limestone skeletons over countless years, all dependant on just the right amount of temperature, salinity, light penetration, water movements, abundance of food and oxygen and other vital factors. In each direction a kaleidoscope of sea life flourishes, there are fish you see which have taken their colours from a tropical sunset, a slow swimming cream, brown and scarlet lionfish (Pterois volitans) with feathery fins parades by, a school of pinkish-red mores perch (Lutjanus russelli) pass on, a red bellied fusilier (Caesio cuning erythrogaster) with colours like a tropical butterfly swims away, some many-lined sweetlip (Plectorhynchus goldmanni) coloured brilliant yellow, silver, red and black peer at you, a coral trout (Plectropoma maculatum) stares out from a coral grotto: conspicuous small banded sergeant majors (Abudefduf sp) are plentiful; another cone shell (Conus marmoreus), this one is almost black with tiny triangular patches; surgeon fish (Acanthurus sp) glide pass; blue and olive scaled tusk fish (Choerodon sp) with beak-like jaws gracefully swim by. A detached mushroom coral (Fungia sp) appears on the pure white sand beneath. Small tube worms (Spirobranchia) of red, white, blue and brown look like tiny Christmas trees on large porite coral (Porites), and in the distance a timid one meter white tip shark (Triaenodon apicalis) disappears, while appearing into view is a school of gold and silver stiped perch (Lutjanus carponotatus).

Pausing briefly and glancing towards the reef edge where cobolt blue water plunges to 20 fathoms, a large dark outline is noticed resembling a huge bat like figure. It is a manta ray (Manta alfredi), quite harmless, cruising along and scooping up microscopic plankton with its gigantic mouth.

You slowly return to your starting point and encounter more of the incredible loveliness of the submarine gardens. Close by, a school of dark-banded, bridled spine cheek fish (Scolopsis bilineatus) with their large eyes watch you, also exquisite long-snouted, beaked coral fish (Chelmon rostratus) with their vivid orange bands, cautiously take cover in a coral patch; there are other fish too, small and large, some speckled, barred, spotted as well as some elegant fish with tassles.

Another completely different type of coral is found growing on the more protected sandy reef flats, with twisted stems, some coarse and twisted to a metre in height (Enhalus sp), others have small emerald tinged leaves with tender pale stems (Halophila sp) or carry curved strap shaped leaves (Thalassia sp). Both the sea grasses and the many algae species present play a vital role at the high and low water zone where they provide refuge and food chains for many marine animals.

It is almost unbelievable to think at the end of it all, that only an hour has elapsed, only a fraction of the total reef complex you stand on has been explored, yet, so much has

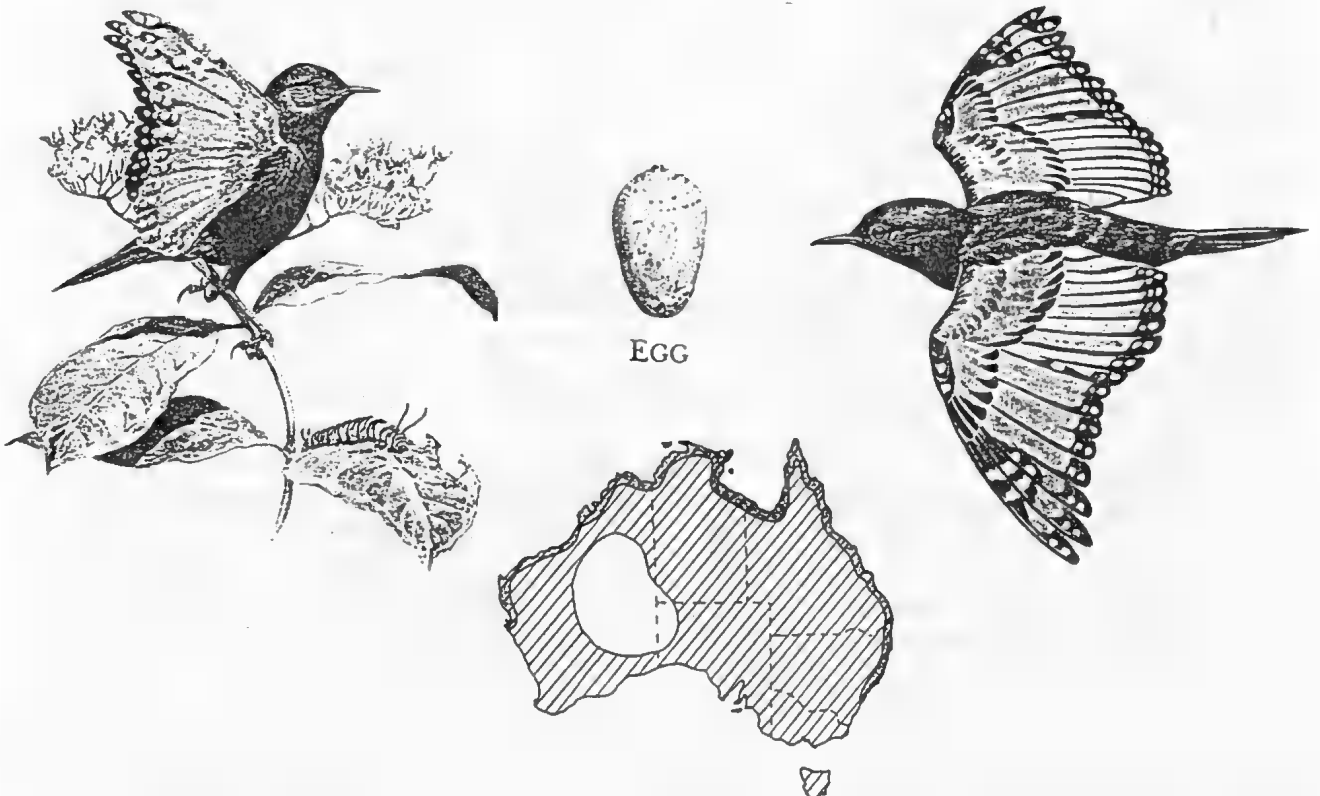
absorbed your attention. It seems every imaginable colour and shape nature provides has just been witnessed, and you hope you will never forget what you have seen.

YEULE HONEYEATER
Darnitis aninsect

This small black bodied bird with its pale orange coloured wings has escaped detection for many years because of its peculiar habit of migrating with flocks of Yeule Butterflies. (Note: Recent migrations late October early November). While heavier bodied than the Yeules, the wing pattern of the species is a surprising match to those of the butterfly. Predators apparently see this bird as a butterfly with a distinct weight problem.

OBSERVATION HINT: This species can best be observed at close range by examining the front grill of your vehicle after driving through a flock of Yeule Butterflies. Remember to drive slowly, since only live specimens can be added to your bird list.

SPECIALIZED EQUIPMENT: Car with fine mesh grill.



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MEMOIRS OF THE QUEENSLAND MUSEUM 37(1):68.1994:-AN EARLY FLECKER RADIOGRAPH OF HYDROPHIS ELEGANS, AND NEW INFORMATION ON ITS FEEDING HABITS.

Dr. Hugo Flecker (1884 - 1957) was a prominent naturalist/radiologist who spent much of his life in Cairns, NEQ. His work is widely known. He made large, significant, botanical collections; founded the North Queensland Naturalist Club; and published extensively on plant and animal injuries to humans. A host of plant and animal species bear the name fleckerii in recognition of the value of his contributions to natural history. Flecker was also a pioneer in the field of radiotherapy and published on this, and on early bone development in humans (Clarkson, 1990; Pearn, 1994).

It is not surprising to find that Flecker combined his major interests of natural history and radiology. He took at least 20 radiographs of native animals. These have recently been rediscovered (JRC). Amongst the series of prints (all original films appear to be lost) are radiographs of two species of sea snakes, Hydrophis elegans and Astrotia stokesii. That of the latter species is insignificant zoologically. However, that of the H. elegans specimen provides new data on the feeding habits of this species, and is of aesthetic interest (Fig 1). Neither of the sea snake radiographs bears a date. However, as others in the series were taken in 1939, it seems reasonable to suggest those of the sea snakes date, at least roughly, from the same era.

The prey species of many sea snakes of Australia's tropical and sub-tropical waters are well known (e.g. Limpus, 1987). Most are bottom feeders. Some have ultra-specialized diets (e.g. Emydocephalus annulatus which feeds on only blennioid and gobioid fish eggs from burrows in coral reefs). A few feed on a wide range of animals (e.g. Aipysurus laevis eats fish, prawns, crabs, worms and fish eggs from coral and rock reefs). H. elegans is reported to feed solely on very elongate fishes from soft bottom inshore waters (Limpus, 1987).

Flecker's photograph shows clearly three fish (the posterior-most specimen is a Herring, Family Clupidae: the others are Cardinal Fish, Family Apogonidae: R McKay, pers. comm.) and a shrimp (Infraorder Caridea: J. Short, pers. comm.) in the gut of a specimen identified by him as H. elegans. This suggests that H. Elegans may be a less highly specialised feeder than reported to date.

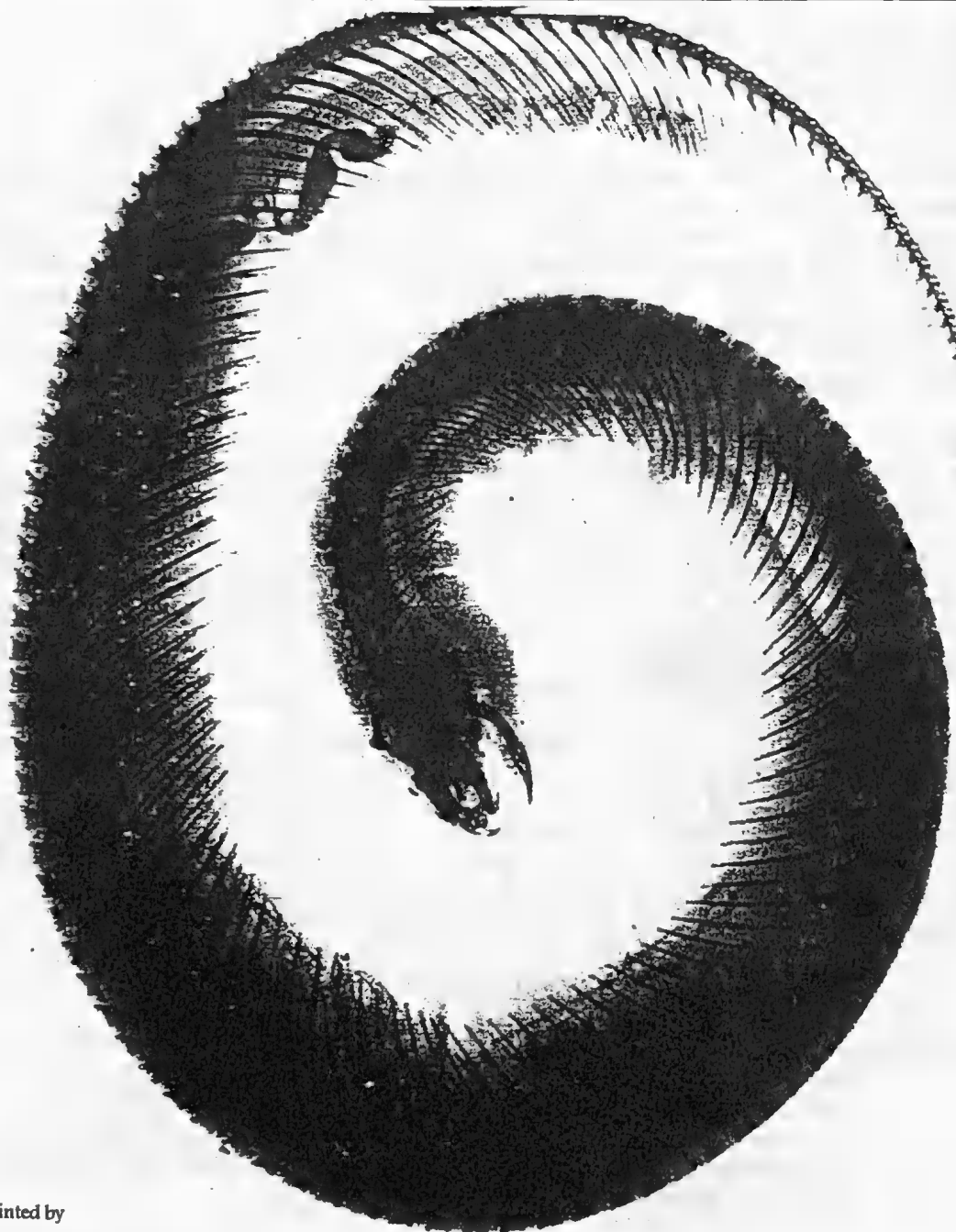
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DID YOU KNOW?

ACCORDING TO THE LAST COPY OF 'THE NORTHERNER' NEWSPAPER - PUBLISHED ON 18TH APRIL, 1968 AND RECENTLY PRESENTED TO ONE OF OUR MEMBERS BY STANLEY AND LILLIAN ST. CLOUD, NATURALIST AND ORCHID ENTHUSIAST, THAT PETER SLATER CO AUTHOR OF 'SLATERS FIELD GUIDE TO AUSTRALIAN BIRDS' WAS A TEACHER IN INNISFAIL?

The article reads:-

BIRDS BRING HIM TO NORTH QUEENSLAND

The wealth of bird life in Far North Queensland has brought a noted ornithologist from Western Australia to work in Innisfail as a schoolteacher.

The Queensland Education Department has just accepted Mr. Peter Slater as a Grade Seven teacher at Innisfail State School in Emily Street.

Using Innisfail as a base, Mr Slater is investigating the birds of the Tableland-Iron Range-Cairns area. Rainforest dwellers and the *myriad of waders and water birds of the Cairns harbour particularly interest him.

He plans to spend a couple of years here. At present he is painting and photographing birds for a 'Field Guide to Australian Birds' on which he has been working for the past sixteen years.

Several other ornithologists are assisting with the Guide, which will have as wide an appeal to laymen as well as specialists. It will allow the casual birdwatcher 'hunting up' a bird to identify it immediately from a clear illustration in colour. For the student the Guide will include the most advanced system of identification yet devised. Mr. Slater hopes the Guide will be completed and sent to publishers.

On April 1st, he sent to publishers the manuscript of his latest book, which he describes as 'an impressionistic study of the hidden face of Australia'.

Due for release in time for Christmas, the book as yet has no title. Expected any day in bookshops in the south is his 'Birds of Australia' produced in collaboration with Stanley Breeden. Many of the Australian birds which appear in the 'Nature Programme' series for children by American publishers Doubleday and Co. were photographed by Mr. Slater. English, American and Swiss publications have carried his illustrations and notes.

On the cover of a recent Swiss book was a 'Golden-Backed Honeyeater' photographed in north-west Australia.

Since he began teaching, Mr. Slater has served in schools in many parts of Western Australia, including the Nullarbor

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Plain. He spent 5 years in the far north of WA at Derby and the Kimberley Research Station in the days when the first cotton-growing experiments were being made in 1955-56. Most recently he taught at Roleystone Primary School outside Perth.

The father of a two year old boy, Mr. Slater has a tireless assistant in his wife Pat, who teaches at the Innisfail High School. An accomplished wildlife photographer herself, Mrs. Slater recently won a bronze medal at an International Salon held in Sydney. The subject of her prize-winning colour transparency was - of course - and Australian wild bird.

From the date of publication of the above article, 18th April 1968 to todays date 18th April, 1995 some 27 years have lapsed.

We celebrate the arrival in Cairns of yet another distinguished ornithologist Dr. Christoph Imboden. Dr. Imboden is Director-General of Birdlife International. Birdlife International is the peak global ornithological NGO, with 'partner' organisations based in most countries of the world (in Australia the Birdlife partner is the Royal Australian Ornithologists Union).

Dr. Imboden's visit to Cairns is to talk authoritatively from his indepth knowledge of this region (encompassing North Australia, Indonesia east of the Wallace Line and Papua New Guinea also known as 'The Arafura') on regional conservation and tourism.

Although Dr. Imboden's time was limited Natuaralists and Bird Observers took this opportunity to have Dr. Imboden endorse the importance of the Cairns mudflats to migratory birds, by having our Mayor Mr Tom Pyne and Councillor Darren Cleland meet on the Cairns Esplanade to view some of these migratory birds and to again emphasize the importance of the area's preservation.

As Eco-tourism is becoming an increasingly popular holiday feature Dr. Imboden's theory is to promote Cairns as having one of the world's most unique bird feeding areas. Why try to have Cairns as a carbon copy of every other esplanade world wide? Indeed with increasing demand for natural tourist locations and the strain placed upon the environment Dr. Imboden's suggestion is indeed a worthwhile consideration.

From Mr. Slater's work towards a 'Field Guide for Australian Birds' to the important issue today of conservation / tourism, one can only hope that in another 27 years there will still be a need for the now familiar Guide to the migratory and other birds of the Cairns, Tableland and Iron Range areas.

E. Duignan
(EDITOR).

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